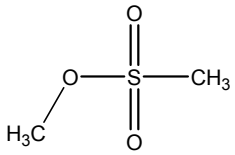
METHYL METHANESULFONATE
CAS No. 66-27-3
First Listed in the *Sixth Annual Report on Carcinogens*



CARCINOGENICITY

Methyl methanesulfonate is *reasonably anticipated to be a human carcinogen* based on sufficient evidence of carcinogenicity in experimental animals (IARC V.7, 1974; IARC S.7, 1987). When administered in the drinking water, methyl methanesulfonate increased the incidence of lung tumors and thymic lymphomas in male mice. When administered by subcutaneous injection, methyl methanesulfonate induced local tumors in three male rats (two squamous cell carcinomas and one polymorphic cell sarcoma). In a similar study, methyl methanesulfonate induced three local sarcomas and one nephroblastoma in four male rats. When administered by a single intraperitoneal injection, methyl methanesulfonate induced one oligodendroglioma, one malignant neurofibroma, one astrocytoma, and a meningioma of the spinal cord in rats of both sexes. Prenatal exposure by a single intravenous injection on day 15 or day 21 of gestation induced five malignant neurinomas, one mixed glioma, and one oligodendroglioma in offspring of female rats.

There are no data available to evaluate the carcinogenicity of methyl methanesulfonate in humans (IARC V.7, 1974; IARC S.7, 1987).

PROPERTIES

Methyl methanesulfonate is a colorless liquid with a boiling point of 203°C. It is soluble in water at 25°C and in dimethyl formamide and propylene glycol and is slightly soluble in nonpolar solvents. When heated to decomposition, methyl methanesulfonate emits toxic fumes of SO_x (Sax and Lewis, 1987).

USE

Methyl methanesulfonate is used experimentally as a mutagen, teratogen, and brain carcinogen; as a research chemical; and as a catalyst in chemical synthesis (IARC V.7, 1974; Sax and Lewis, 1987; Merck, 1989; HSDB, 1989). It has been tested as a cancer chemotherapeutic agent (Bateman et al., 1966; IARC V.7, 1974). A potential use is as a chemosterilant. The monoesters of methanesulfonic acid may be reversible insect and mammalian pest chemosterilants as well as possible human male contraceptives (Jackson, 1964; IARC V.7, 1974).

PRODUCTION

Production of methyl methanesulfonate is likely to be limited to research purposes (IARC V.7, 1974). There are no indications that methyl methanesulfonate is produced commercially, and no import and export data are reported (HSDB, 1989; USITC, 1986, 1987, 1988, 1989).

EXPOSURE

Its limited production and its use as a research chemical could result in some environmental release through waste streams. It will hydrolyze rapidly. It has high mobility in soil. Its vapor phase half-life is 69 days.

No permissible exposure limits for methyl methanesulfonate have been established by OSHA, NIOSH, or ACGIH (Hazardline, 1989). Occupational exposure should be currently limited to laboratory research and housekeeping personnel. Potential exposure for the general population exists if methyl methanesulfonate is approved for the production of chemosterilants for insects and mammalian pests or as a human male contraceptive or cancer chemotherapeutic agent. Methyl methanesulfonate is not known to occur in nature (IARC V.7, 1974).

REGULATIONS

In 1980 CPSC preliminarily determined that methyl methanesulfonate was not present in consumer products under its jurisdiction. Subsequently, public comment was solicited to verify the accuracy of this information; no comments were received. Pending receipt of new information, CPSC plans no action on this chemical. EPA regulates methyl methanesulfonate under the Resource Conservation and Recovery Act (RCRA). It has established rules for hazardous spills and requirements for handling and disposal of methyl methanesulfonate wastes. The compound is regulated as a hazardous constituent of waste under RCRA. OSHA regulates methyl methanesulfonate under the Hazard Communication Standard and as a chemical hazard in laboratories. Regulations are summarized in Volume II, Table B-83.